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10/612,442	06/30/2003	Yu Wang	NPO 20821-1-CU	8197

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EXAMINER	
YAM, STEPHEN K	
ART UNIT	**PAPER NUMBER**
2878	

DATE MAILED: 07/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/612,442	WANG, YU
	Examiner	Art Unit
	Stephen Yam	2878

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 May 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-9 and 15-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *3-6* is/are allowed.

6)☒ Claim(s) *1,7-9 and 15-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 June 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *0603*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group II in the reply filed on May 4, 2005 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

The requirement is still deemed proper and is therefore made FINAL.

Double Patenting

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claim 1 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 7 of U.S. Patent No. 6,072,175. Although the conflicting claims are not identical, they are not patentably distinct from each other because both recite a similar microchannel structure which permits the passage of only unscattered radiant energy through channels and aligned with a pixel/sensing element of an image sensor array.

Drawings

4. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the sample having a first side and a second side with radiant energy illuminating the *first side* of the sample, with the first end of the microchannel structure placed *near the second side of the sample on the side opposite the source of radiant energy*, with a *waveguide* for conducting the radiant energy to the sample, as recited in Claim 1, must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

5. The disclosure is objected to because of the following informalities:

The disclosure is non-enabling with respect to the recited subject matter of Claim 1. The specification does not disclose the embodiment of Claim 1, specifically with the sample having a first side and a second side with radiant energy illuminating the *first side* of the sample, with the first end of the microchannel structure placed *near the second side of the sample on the side opposite the source of radiant energy*, with a *waveguide* for conducting the radiant energy to the sample.

Appropriate correction is required.

Claim Objections

6. Claim 3 is objected to because of the following informalities:

In Claim 3, line 17, "the sample" lacks proper antecedent basis.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 15 and 17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In Claims 15 and 17, it is unclear how light is transmitted from the solid-state emitter to the waveguide and thereon to the beam splitting element, if the *first side* of the solid-state emitter radiates energy (eg.- Claim 15, line 5) and the first end of the waveguide is attached to the *second side* of the solid-state emitter allowing radiant energy from the solid-state emitter to enter the waveguide (eg.- Claim 15, lines 8-11). For examination purposes, Examiner interprets Applicant's intention as the first end of the waveguide attached to the *first side* of the solid-state emitter.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claims 1 and 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Immega et al. US Patent No. 5,726,443.

Regarding Claim 1, Immega et al. teach (see Fig. 1 and 3) a device, comprising a source (35) of radiant energy for illuminating a sample (24), the sample having a first side (top) and a second side (bottom), the radiant energy illuminating the first side of the sample (see Fig. 3), a plurality of narrow angle filters (4) (see Fig. 1 and 3) comprising a microchannel structure (see

Fig. 3) to permit the passage of only unscattered radiant energy through the microchannels (see Col. 3, lines 62-67), the microchannel structure having a first end (top) and a second end (bottom), the first end of the microchannel structure placed near the second side of the sample on the side (bottom) opposite the source of radiant energy (see Fig. 3), some portion of the radiant energy entering the microchannels from the sample (see Fig. 3), a solid-state sensing array (2a) (see Fig. 1, and Col. 14, lines 3-6) comprising a plurality of sensing elements (1) attached to the second end of the microchannel structure (see Fig. 3), the sensing elements being sensitive to radiant energy (see Col. 14, lines 3-5), a plurality of the microchannels being aligned each to correspond with an individual sensing element of the solid-state sensing array (see Fig. 3), wherein that portion of the radiant energy entering the microchannels that is parallel to the microchannel walls travels to the corresponding sensing elements (see Fig. 1 and 3) generating electrical signals that can enable an image to be reconstructed by an external device (27) (see Col. 14, lines 18-23). Although the device of Immega et al. is not directed towards a solid-state scanning microscope, Applicant's claim language does not provide any structural limitations limiting the device to a solid-state scanning microscope- therefore, the limitation in the preamble of the device as a solid-state scanning microscope is directed towards an intended use of the device, and hence, cannot be given patentable weight. Immega does not teach the radiant energy as collimated or a waveguide for conducting the radiant energy to the sample. It is well known in the art to provide collimated illuminating light in an imaging system, to maximize the light intensity and provide uniform illumination, and to use a waveguide to direct light (radiant energy) onto a sample, to provide the ability to locate the light source in a remote or external location. It would have been obvious to one of ordinary skill in the art at the time the invention

was made to provide the radiant energy as collimated and provide a waveguide for conducting the radiant energy to the sample, in the device of Immega et al., to provide optimal illumination for highlighting features on the sample and capturing an optimal image of the sample.

Regarding Claim 7, Immega et al. teach (see Fig. 1-3) a device comprising a plurality of narrow angle filters (4) (see Fig. 1 and 3) comprising a microchannel structure (see Fig. 3) to permit the passage of only unscattered radiant energy through the microchannels (see Col. 3, lines 62-67), the microchannel structure having a first end (bottom) and a second end (top), a solid-state sensing array (2a) (see Fig. 1, and Col. 14, lines 3-6) comprising a plurality of sensing elements (1) attached to the first end of the microchannel structure (see Fig. 3), the sensing elements being sensitive to radiant energy (see Col. 14, lines 3-5), a plurality of the microchannels being aligned each to correspond with an individual sensing element of the solid-state sensing array (see Fig. 3), a plurality of emitters (33) (see Col. 15, lines 13-14) for emitting radiant energy mounted on the second end of the microchannel structure (see Fig. 2 and 3), the emitters illuminating the surface of a sample (see Fig. 2 and 3 and Col. 15, lines 14-19), some portion of the radiant energy being reflected by the sample to enter the microchannels (see Col. 15, lines 18-20), that portion of the radiant energy entering the microchannels that is parallel to the microchannel walls travels to the sensing elements (see Fig. 3) to generate electrical signals that can enable an image to be reconstructed by an external device (27) (see Col. 14, lines 18-23), and a transparent planar member (31) adjacent to the second end of the microchannel structure, the transparent cover protecting the second end of the microchannel structure from damage and preventing the entrance of foreign objects into the microchannels (see Col. 15, lines 8-10). Although the device of Immega et al. is not directed towards a solid-state scanning

microscope, Applicant's claim language does not provide any structural limitations limiting the device to a solid-state scanning microscope- therefore, the limitation in the preamble of the device as a solid-state scanning microscope is directed towards an intended use of the device, and hence, cannot be given patentable weight. Immega et al. do not teach the emitter as a solid-state emitter or the transparent covering containing conduction paths to conduct power to the solid-state emitters. It is well known in the art to use solid-state emitters, to provide optimal illumination with reduced power consumption, and to provide conduction paths, as appropriate, along any part to conduct power to other components, to enable the powering of all the electronic components within the device. It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the emitters as solid-state and provide conduction paths on the transparent cover to conduct power to the solid-state emitters in the device of Immega et al., to provide optimal illumination without excessive power consumption and to provide accessible electrical coupling points for easier electrical connection to the components of the device.

Regarding Claims 8 and 9, Immega et al. teach the device in Claim 7, according to the appropriate paragraph above. Immega et al. do not teach the solid-state emitters as light emitting diodes or light emitting polymers. It is well known in the art to provide a variety of light sources for providing illumination in a system, depending on the desired type of illumination and other cost or design considerations, and that light emitting diodes and polymers are common light source components. It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the solid-state emitters as light emitting diodes or light emitting

polymers in the device of Immega et al., to select a common light emitting component which provides stable illumination and efficient power consumption.

11. Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang US Patent No. 6,072,175 in view of Turner US Patent No. 5,835,649

Regarding Claim 15, Wang teaches (see Fig. 4A, 4B) a solid-state scanning microscope comprising a scanning stage (408) (see Fig. 4A) for providing structural support for moving the microscope (see Col. 2, lines 49-50), the scanning stage having a first side (bottom) and a second side (top), a solid-state emitter (402) for radiating energy (see Col. 2, lines 47-48), a narrow angle filter (404) comprising a microchannel (see Col. 2, lines 48-49) to permit the passage of only unscattered radiant energy through the microchannel (see Col. 2, lines 49-65), the microchannel having a first end (top) and a second end (bottom), a beam splitting element (400) adjacent to the second end of the solid-state emitter and near a sample (see Fig. 4A), the beam splitting element having a first side (left), a second side (bottom), and a third side (top), wherein the first side of the beam splitting element is perpendicular to the sample and receives the reflected radiant energy from the solid-state emitter and conducts the radiant energy to exit the second side of the beam splitting element (see Fig. 3), the second side of the beam splitting element being adjacent to a sample (see Fig. 3 and 4A) and directing a portion of the radiant energy to the sample and receiving some portion of the radiant energy reflected by the sample (see Fig. 3), the third side of the beam splitting element being opposite the second side of the beam splitting element and adjacent to the second end of the microchannels (see Fig. 3), the third side of the beam splitting element directing some portion of the reflected radiant energy to enter

the microchannels (see Fig. 3), some portion of the radiant energy being reflected by the sample to enter the microchannel, (see Col. 2, lines 32-39) and a solid-state sensing element (406) (see Col. 2, lines 36-38 and 49-50) having a first side (bottom) and a second side (top), the sensing element detecting radiant energy from the first side (see Fig. 3 and 4A), the second side of the sensing element mounted to the first side of the scanning stage (see Fig. 4A), wherein that portion of the radiant energy entering the microchannel that is parallel to the microchannel walls travels to the sensing element to generate an electrical signal that can enable an image to be reconstructed by an external device (using image sensor output). Wang does not teach the emitter having a first side and a second side, the first side of the emitter radiating energy, the second side of the emitter mounted to the first side of the scanning stage, a waveguide having a first end, a second end, and an internally reflective surface, the first end of the waveguide being attached to the first side of the solid state emitter allowing radiant energy from the solid-state emitter to enter into the waveguide to be reflected by the internally reflective surface, the reflected radiant energy exiting at the second end of the waveguide, with the sensing element adjacent to the solid state emitter. Turner et al. teaches (see Fig. 4) a similar device, with an emitter (generating (40)) having a first side (top) and a second side (bottom), the first side of the emitter radiating energy (40) (see Fig. 4), a waveguide (12) having a first end (bottom), a second end (top), and an internally reflective surface (since an optical fiber inherently has a reflective inner surface to provide total internal reflection), the first end of the waveguide being attached to the first side of the emitter allowing radiant energy from the emitter to enter into the waveguide to be reflected by the internally reflective surface (see Fig. 4), the reflected radiant energy exiting at the second end of the waveguide (see Fig. 4). It is well known in the art to mount multiple

components on a single platform, to provide easier electrical inter-connections and a modular design. It would have been obvious to one of ordinary skill in the art at the time the invention was made provide to the emitter having a first side and a second side, the first side of the emitter radiating energy, a waveguide having a first end, a second end, and an internally reflective surface, the first end of the waveguide being attached to the first side of the solid state emitter allowing radiant energy from the solid-state emitter to enter into the waveguide to be reflected by the internally reflective surface, the reflected radiant energy exiting at the second end of the waveguide, as taught by Turner et al., and locate the solid-state emitter with the second side mounted to the first side of the scanning stage and adjacent to the sensing element, in the device of Wang, to provide a smaller profile for the device by orienting components vertically to enable a more efficient physical structure.

Regarding Claim 16, Wang in view of Turner et al. teach the device in Claim 15, according to the appropriate paragraph above. Wang does not teach the beam splitting element having a polarizing filter. It is well known in the art to provide a polarizing filter within a beam splitting element, to reduce the number of optical components while providing increased optical clarity. It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the beam splitting element having a polarizing filter in the device of Wang in view of Turner et al., to filter out external light interference and increase the optical contrast of the detected image.

Allowable Subject Matter

12. Claims 3-6 are allowed over the prior art of record.

13. Claims 17 and 18 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

14. The following is a statement of reasons for the indication of allowable subject matter:

Regarding Claim 3, the invention as claimed, specifically in combination with the planar member allowing for an air-gap between the planar member and the microchannel structure, an index matching fluid placed adjacent to the second side of the planar member, the index matching fluid being matched to the index of the planar member, the index matching fluid continuously filling the region between the surface of the sample and the second side of the planar member, and a prism placed upon the planar member so as to conduct the source of radiant energy operatively into the planar member, is not disclosed or made obvious by the prior art of record.

Regarding Claim 17, the invention as claimed, specifically in combination with a scanning stage for providing structural support for moving the microscope, a plurality of solid-state emitters for radiating energy, the wavelength of radiant energy of a predetermined number solid-state emitters is of at least two substantially different wavelengths, a plurality of waveguides, each waveguide having a first end, a second end, and an internally reflective surface, the first end of each waveguide being attached to the first side of a solid state emitter allowing radiant energy from the solid-state emitter to enter into the waveguide to be reflected by the internally reflective surface, the reflected radiant energy exiting at the second end of the waveguide, and a plurality of beam splitting elements, each beam splitting element adjacent to

the second end of the waveguide and near a sample, the beam splitting elements each having a first side, a second side, and a third side, wherein the first side of each beam splitting element is perpendicular to the sample and receives the reflected radiant energy from the waveguide and conducts the radiant energy to exit the second side of the beam splitting element, the second side of the beam splitting element being adjacent to a sample and directing a portion of the radiant energy to the sample and receiving some portion of the radiant energy reflected by the sample, the third side of the beam splitting element being opposite the second side of the beam splitting element and adjacent to the second end of the microchannels, the third side of the beam splitting element directing some portion of the reflected radiant energy to enter the microchannels, some portion of the radiant energy being reflected by the sample to enter the microchannel, is not disclosed or made obvious by the prior art of record.

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Romhild US Pre-grant Publication No. 2003/0168580 teaches a device with channels allowing unscattered light to be reflected off a sample and reach a photodiode.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen Yam whose telephone number is (571)272-2449. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (571)272-2444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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THANH X. LUU
PATENT EXAMINER